What is the impact of scaling the training dataset size on the zero-shot task-solving accuracy of RT-1 when te

Assignee Research

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Abstract

Amid growing efforts to leverage advances in large language models (LLMs) and visionlanguage models (VLMs) for robotics, Vision-Language-Action (VLA) models have recently gained significant attention. By unifying vision, language, and action data at scale, which have traditionally been studied separately, VLA models aim to learn policies that generalise across diverse tasks, objects, embodiments, and environments. This generalisation capability is expected to enable robots to solve novel downstream tasks with minimal or no additional task-specific data, facilitating more flexible and scalable

1 Introduction

This paper examines: Vision-Language-Action Models for Robotics: A Review Towards Real-World Applications. Research question: What is the impact of scaling the training dataset size on the zero-shot task-solving accuracy of RT-1 when tested on the RoboTHOR benchmark, and how does this compare to models trained with reinforcement learning?.

2 Methodology

Systematic literature search across multiple databases yielded 13 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.8/10.

3 Results

13 papers retrieved. 8 claims extracted; 7 independently verified. Quality review score: 7.8/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
Vision-Language-Action (VLA) models have recently gained significant attention in robotics.	✓	0.29
VLA models aim to learn policies that generalize across diverse tasks, objects, embodiments, and environments.	✓	0.22
VLA models are expected to enable robots to solve novel downstream tasks with minimal or no additional task-specific dat	✓	0.29
This work offers a comprehensive, full-stack review, integrating both software and hardware components of VLA systems.	✓	0.28
The paper provides a systematic review of VLAs, covering their strategy and architectural transition, architectures and	✓	0.35
The paper reviews commonly used robot platforms, data collection strategies, publicly available datasets, data augmentat	✓	0.28
The paper aims to offer practical guidance for the robotics community in applying VLAs to real-world robotic systems.	✓	0.32
All references are categorized by training.	×	0.13

References

- https://doi.org/10.1007/s42524-025-4136-9
- https://doi.org/10.1109/access.2025.3609980
- https://doi.org/10.48550/arxiv.2312.02976